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JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

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Vol. 62

September, 1960

No. 741

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The New England Botanical Club, Inc.

Botanical Museum, Oxford St., Cambridge 38, Mass.

RHODORA.—A monthly journal of botany, devoted primarily to the flora of North America and floristically related areas. Price, \$6.00 per year, net, postpaid, in funds payable at par in United States currency in Boston; single copies (if available) 60 cents. Back volumes 1-58, with a few incomplete, can be supplied at \$5.00 per volume. Volume 59—available at \$6.00. Somewhat reduced rates for complete sets can be obtained upon application.

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Address manuscripts and proofs to Reed C. Rollins,
Gray Herbarium, 22 Divinity Avenue, Cambridge 38, Mass.

Subscriptions and orders for back issues (making all remittances payable to RHODORA) should be sent to Albert F. Hill, Botanical Museum, Oxford Street, Cambridge 38, Mass.

Second Class Postage Paid at Boston, Mass.

Printed by
THE LEXINGTON PRESS, INC.
Lexington, Mass.

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NOVELTIES IN THE DOMINICAN FLORA

JOSÉ DE JS. JIMÉNEZ¹

Since the publication of Moscoso's *Catalogus Florae Domingensis* in 1943, several botanical explorations in our country have been carried out which have resulted in the discovery of a number of unrecorded species, some new to science, others first records for our Island whose centers of dispersion are localized in the surrounding countries and islands.

The continuing correspondence with foreign botanical libraries, herbaria and botanists, the acquisition of ancient and modern scientific works on the West Indian Floras and the revision of many taxonomic groups by eminent botanical authorities have brought forth a better knowledge of our vegetation, the identification of new species, the reduction of many binomials to synonymy, new combinations according to recent concepts in the consideration of genera and species and so forth.

Out of these botanical investigations and from the study of our collections, we have found about 700 species not included in the above mentioned work. With them we have prepared a Supplement to it hoping that in the near future we will be able to have it in print. At the request of many friends, we have extracted the novelties from the manuscript of the supplement and they are presented here in anticipation of their ultimate inclusion in the larger work.

¹Taxonomist of the Instituto Botánico "RAFAEL M. MOSCOSO," UNIVERSITY OF SANTO DOMINGO, Dominican Republic.

I am particularly indebted to Dr. Reed C. Rollins and Dr. Richard A. Howard for the kindness of reading the manuscript and making very useful and valuable suggestions. To both gentlemen my warmest gratitude.

PALMACEAE

Zombia antillarum Bailey var. **GONZALEZII** Jiménez, var. nov.

Haec varietas a forma typica speciei fructibus minoribus sordide flavis et pyriformibus recedit.

This variety differ from the type species in having smaller fruits, 15-16 mm. long, 10-11 mm. broad; in their pyriform shape instead of globose-oblong and in the dirty-yellow colour instead of waxy-white. DOMINICAN REPUBLIC: Near Santiago Rodriguez, Province of Santiago Rodriguez, Jiménez 2590-B, (type).

ORCHIDACEAE

Bletia purpurea (Lam.) DC var. **ALBA** Ariza-Julia & Jiménez, var. nov.

Haec varietas a forma typica speciei floribus albis et disco flavo recedit.

This variety differ from the type species in having white flowers and a yellow disc. DOMINICAN REPUBLIC: Collected by Mr. Luis Ariza Julia at Yásica, on the road, between Yásica and Yasiuita bridges, Province of Puerto Plata and cultivated in his garden, Jiménez 3714, (type). **Laeliopsis domingensis** Lindl. var. **ALBA** Ariza-Julia & Jiménez, var. nov.

Haec varietas a forma typica speciei floribus albis differt.

This variety differ from the typical species in having white flowers. DOMINICAN REPUBLIC: El Canal, Sosúa, Province of Puerto Plata, Jiménez 3715, (type).

CAESALPINIACEAE

Cassia enneryana (Britton) Jiménez, comb. nov.

Chamaecrista enneryana Britton, N. A. Flora 23. 5: 275. 1930.

Cassia fitchiana (Britton & Rose) Jiménez, comb. nov.

Peirania fitchiana Britton & Rose, N. A. Flora 23. 4: 264. 1930.

Cassia froidensis Jiménez, nom. nov.

Chamaecrista haitiensis Britton, N. A. Flora 23. 5: 276. 1930.

Cassia haitiensis (Britton) Jiménez, comb. nov.

Peirania haitiensis Britton, N. A. Flora 23. 4: 261. 1930.

Cassia leonardae (Britton) Jiménez, comb. nov.

Chamaecrista leonardae Britton, N. A. Flora 23. 5: 281. 1930.

RUTACEAE

Zanthoxylum anadenium (Urb. & Ekm.) Jiménez, comb. nov.

Fagara anadenia Urb. & Ekm. in Ark. foer Bot. Bd. 24A. 4: 15. 1931.

Zanthoxylum azuense (Urb. & Ekm.) Jiménez, comb. nov.

Fagara azuensis (Urb. & Ekm.) in Ark. foer Bot. Bd. 22A. 8: 55. 1928.

Zanthoxylum domingense (Krub & Urb.) Jiménez, comb. nov.

Fagara domingensis Krug & Urb. in Engl. Jahrb. 21: 586. 1896.

Zanthoxylum furcyense (Urb.) Jiménez, comb. nov.

Fagara furcyensis Urb. in Ark. foer Bot. Bd. 20A. 5: 16. 1921.

Zanthoxylum haitiense (Urb.) Jiménez, comb. nov.

Fagara haitiensis Urb. in Ark. foer Bot. Bd. 20A. 15: 36. 1926.

- Zanthoxylum lenticellosum** (Urb. & Ekm.) Jiménez, comb. nov.
Fagara lenticellosa Urb. & Ekm. in Ark. foer Bot. Bd. 24A. 4: 13. 1931.
- Zanthoxylum leonardi** (Urb.) Jiménez, comb. nov.
Fagara leonardi Urb. in Fedde Repert. 24: 5. 1927.
- Zanthoxylum nigrescens** (Urb. & Ekm.) Jiménez, comb. nov.
Fagara nigrescens Urb. & Ekm. in Ark. foer Bot. Bd. 22A. 8: 53. 1928.
- Zanthoxylum obcordatum** (Urb. & Ekm.) Jiménez, comb. nov.
Fagara obcordata Urb. & Ekm. in Ark. foer Bot. Bd. 20A. 15: 36. 1926.
- Zanthoxylum obtriangulare** (Urb.) Jiménez, comb. nov.
Fagara obtriangularis Urb. in Ark. foer Bot. Bd. 22A. 8: 54. 1928.
- Zanthoxylum tetraphyllum** (Urb. & Ekm.) Jiménez, comb. nov.
Fagara tetraphylla Urb. & Ekm. in Ark foer Bot. Bd. 20A. 5: 15-16. 1926.

ERICACEAE

- Lyonia apiculata** (Sleumer) Jiménez, comb. nov.
Xolisma apiculata Sleumer in Fedde Rep. 36: 270. 1934.
- Lyonia cryptogonia** (Sleumer) Jiménez, comb. nov.
Xolisma cryptogonia Sleumer in Fedde Rep. 36: 270. 1934.
- Lyonia elongata** (Sleumer) Jiménez, comb. nov.
Xolisma elongata Sleumer in Fedde Rep. 36: 271. 1934.
- Lyonia longelaminata** (Sleumer) Jiménez, comb. nov.
Xolisma longelaminata Sleumer in Fedde Rep. 36: 271. 1934.
- Lyonia orbiculata** (Sleumer) Jiménez, comb. nov.
Xolisma orbiculata Sleumer in Fedde Rep. 36: 272. 1934.
- Lyonia pseudotinensis** (Sleumer) Jiménez, comb. nov.
Xolisma pseudotinensis Sleumer in Fedde Rep. 36: 272. 1934.
- Lyonia urbaniana** (Sleumer) Jiménez, comb. nov.
Xolisma urbaniana Sleumer in Fedde Rep. 36: 273. 1934.

ASCLEPIADACEAE

- Cynanchum aemulans** (Schlecht.) Jiménez, comb. nov.
Metastelma aemulans Schlecht. in Urb. Symb. Ant. 1: 252. 1899.
- Cynanchum crassiusculum** (Schlecht.) Jiménez, comb. nov.
Metastelma crassiusculum Schlecht. in Urb. Symb. Ant. 1: 261. 1899.
- Cynanchum domingense** (Schlecht.) Jiménez, comb. nov.
Metastelma domingense Schlecht. in Urb. Symb. Ant. 1: 251. 1899.
- Cynanchum glabrius** (Markgraf) Jiménez, comb. nov.
Metastelma glabrius Markgraf in Ark. foer Bot. Bd. 22A. 10: 103. 1928.
- Cynanchum gonavense** Jiménez, nom. nov.
Metastelma ekmanii Markgraf in Ark. foer Bot. Bd. 22A. 10: 104. 1928.
- The binomial *C. ekmanii* cannot be applied to this species because Alain in *Flora de Cuba* 4: 205. 1957 had given it to the Cuban endemic species *Astrophytus Schlechterianus* Urb.

Cynanchum gracile (Dcne.) Jiménez, comb. nov.

Metastelma gracile Dcne. in DC. Prodr. 8: 515. 1844.

Cynanchum haitiense Jiménez, nom. nov.

Metastelma astephanooides Schlecht. in Urb. Symb. Ant. 8: 551. 1920.

Cynanchum astephanooides has been used by Standley for the mexican species, *Vincetoxicum astephanooides* Gray. See Standley's Trees and Shrubs of Mexico, Contr. U. S. Nat. Herb. 23: 1177. 1924.

Cynanchum leptocladum (Dcne.) Jiménez, comb. nov.

Metastelma leptocladum (Dcne.) Schlecht. in Urb. Symb. Ant. 1: 261. 1899.

Cynanchum leptophyllum (Schlecht.) Jiménez, comb. nov.

Astephanus leptophyllum Schlecht. in Urb. Symb. Ant. 1: 241. 1899.

Cynanchum occidentale (Spreng.) Jiménez, comb. nov.

Tainionema occidentale (Spreng.) Schlecht. in Urb. Symb. Ant. 1: 264. 1899.

Cynanchum picardae (Schlecht.) Jiménez, comb. nov.

Metastelma Picardae Schlecht. in Urb. Symb. Ant. 1: 252. 1899.

Cynanchum stenoglossum (Schlecht.) Jiménez, comb. nov.

Metastelma stenoglossum Schlecht. in Urb. Symb. Ant. 1: 252. 1899.

Cynanchum tylophoroides (Schlecht.) Jiménez, comb. nov.

Metastelma tylophoroides Schlecht. in Urb. Symb. Ant. 1: 259. 1899.

Matelea constanzana Jiménez, nom. nov.

Poicillopsis Tuerckheimii Schlecht. in Urb. Symb. Ant. 7: 339. 1912.

The binomial *Matelea Tuerckheimii* cannot be utilized in this case because Woodson has previously used it, based on the central american *Gonolobus Tuerckheimii* Donn. See his work "The North American Asclepiadaceae" in Ann. Mo. Bot. Gard. 28: 234. 1941.

Matelea crispiflora (Urb.) Jiménez, comb. nov.

Poicillopsis crispiflora Urb. in Fedde Repert. 19: 7. 1923.

LENTIBULARIACEAE

Pinguicula casabitoana Jiménez, sp. nov.

Herba epiphytica, acaulis; folia integra, linearis-spatulata, basi rosulata, piloso-glandulosa, succulenta, glauca, 1.5-2 cm. longa; scapus axillaris, piloso-glandulosus, uniflorus, usque 5 cm. longus; corolla alba, 7 mm. longa.

Stemless and epiphytic herb, growing on dry twigs of different plants in wet places; leaves forming a basal rosette, linear-spatulate, entire, succulent, glaucous, glandular-hairy, 1.5-2 cm. long, 1 mm. wide; scapes solitary, 1 — flowered, axillary, very slender, glandular-hairy, erect, the longest 5 cm. long; calyx 5 — merous, densely glandular-hairy; corolla white, 5 — merous, 7 mm. long; spur short, obtuse; capsule not seen.

Similar to the Cuban *P. lignicola* Barnh. but differing from it in its more dense pubescence, longer leaves, longer scapes and shorter corollas. DOMINICAN REPUBLIC: Alto de Casabito, Province of La Vega, 1400 m. above sea level, Jiménez 3029, (type). Loma La Vieja, Province of La Vega, Ekman, H-14051.

NEW PLANT RECORDS FROM ILLINOIS

ROBERT H. MOHLENBROCK AND JOHN W. VOIGT

Continued botanical exploration by the authors with efforts centered on southern Illinois has resulted in several additions to the state flora. Since 1955, there have been 114 species and varieties discovered for the first time in the State, and of these, 70 have been taken by the authors, their colleagues, or students in the southern Illinois area. This report concerns the new records discovered in the field or herbarium during 1958 and 1959.

All specimens listed are to be found in the herbarium of Southern Illinois University, Carbondale, with the exception of *Carex oxylepis* var. *pubescens* which has been deposited with Dr. F. J. Hermann, Crops Research Division, U. S. D. A., Beltsville, Maryland, and *Medicago orbicularis* which is in the University of Illinois herbarium.

Ophioglossum vulgatum L. var. *pycnostichum* Fern. JACKSON CO.: sandstone ledge, exposed rock, beneath *Juniperus virginiana*, Giant City State Park, June 25, 1955, R. H. Mohlenbrock 7976A.

This variety, distinguished from var. *pseudopodium* by its dark green, shining sterile blade, has been recorded previously from the states bordering the southern counties of Illinois. Our specimens were determined by Dr. R. M. Tryon of the Gray Herbarium.

Carex austrina (Small) Mackenzie. JACKSON CO.: one mile north of DeSoto, along Illinois Central Railroad, May 27, 1958, D. Schuchardt. PERRY CO.: Pyatts Crossroads, along railroad, May 27, 1958, R. H. Mohlenbrock 10009.

This western sedge has been found previously eastward to southeastern Missouri. The two Illinois stations extend the range by nearly fifty miles. At both places, the sedge was growing abundantly with numerous other sedges and grasses which are typical of these prairie railroad sidings.

Carex emmonsii Dew. UNION CO.: dry wooded slope, growing beneath *Pinus echinata*, Pine Hills, 3 miles northeast of Aldridge, T11S, R3W, sect. 10, April 25, 1959, R. H. Mohlenbrock and R. R. MacMahon 10142.

Here is another member of the *Carex artictecta* complex, flowering very early in the year. The plant is densely cespitose. Most of the spikes are aggregated into a head about 1.5 cm. long. This is the first authentic specimen in Illinois of this species, although it was reported in early literature as occurring in Illinois.

Carex physorhyncha Liebm. RANDOLPH CO.: ledge of bluff, 1½ miles west of West Point, April 24, 1958, R. H. Mohlenbrock 9910. UNION CO.: cherty slope, Pine Hills, 3 miles northeast of Aldridge, T11S, R3W, sect. 10, April 27, 1958, R. H. Mohlenbrock 9927.

Although this species has the general appearance of the very common *Carex artifex*, it is readily distinguished by its cord-like stolons. It was rather abundant in the cherty slopes beneath stands of *Pinus echinata* in the Pine Hills, a habitat reminiscent of the Missouri Ozarks where it occurs also.

Carex oxylepis Torr. & Hook. var. **pubescens** Underw. HARDIN CO.: wooded east-facing slope, Blind Hollow, T11S, R9E, sect. 20, *R. H. Mohlenbrock* 8632.

According to Dr. F. J. Hermann (personal correspondence) who determined the specimen, this unusual *Carex* is known now from its original collection in Tennessee, from Stone County, Arkansas (*R. A. Reed* GI-32), and from the Illinois station.

Carex striatula Michx. UNION CO.: rich mesophytic woods, Panther's Den, near Wayside, 1959, *R. R. MacMahon* 157.

In Illinois, this species most nearly resembles *Carex blanda*, but differs in its pedunculate staminate spike and narrower leaves. It was known previously westward as far as southern Indiana.

Urtica dioica L. var. **dioica**. MONROE CO.: along gravel road, near Fults, May 22, 1958, *R. H. Mohlenbrock* 9986.

All previous collections of *Urtica dioica* in Illinois are referable to var. *gracilis* or var. *procera*. Therefore, the findings of typical *U. dioica* along a country lane in Monroe County came as somewhat of a surprise. The typical variety bears many more stinging hairs, particularly on the surface of the leaves.

Polygonum setaceum Baldw. var. **interjectum** Fern. JACKSON CO.: roadside ditch bordering swampy pin-oak woods, on east side of Illinois Route 3, T9S, R3W, section 29, one mile east of Gorham, September 15, 1958, *R. H. Mohlenbrock* 10013.

A colony of this more eastern variety covered an area of nearly 25 square feet in a ditch in which water stands for most of each year. Known previously only as far west as central Kentucky, this variety differs from var. *setaceum* by having the lower leaf surfaces glabrous.

Draba cuneifolia Nutt. var. **foliosa** nov. var. A typo differt caulis foliis. RANDOLPH CO.: edge of limestone bluff, one mile northwest of Prairie du Rocher, T5S, R9E, section 16, *R. H. Mohlenbrock* 5969.

This variety is strange in that it has leaves the entire length of the stem. As a result, it cannot be keyed out to *Draba cuneifolia* in any of the current manuals. It grows atop limestone bluffs in association with *Draba cuneifolia* var. *cuneifolia* and *Draba reptans*.

Rubus orarius Blanchard. JACKSON CO.: along Illinois Central Railroad, Carbondale, *J. R. Swayne* 62.

Following the conservative treatment of this genus by Gleason (1952), the binomial *R. orarius* should be applied to the specimen cited above. Botanists wishing to attempt to further delimit this specimen would likely come to *Rubus alumnus*.

Crataegus collina Chapm. JACKSON CO.: border of low pin-oak woods,

T9S, R3W, section 29, 1-1/4 miles northeast of Gorham, September 22, 1958, *R. H. Mohlenbrock & J. W. Voigt* 10072.

This unusual hawthorn is rather common throughout the extensive swampy pin-oak woods of western Jackson County. It seldom grows in thickets but is usually found scattered throughout the woodlands. The small trees sometimes reach a height of 20 feet. The nearest known station to the Illinois locality is in the southeastern counties of Missouri.

Medicago orbicularis L. JACKSON CO.: strip mine, June 29, 1950, *Alten Grandt* (no other data available).

The specimen of this rare waif, unlisted by Fernald (1950), is deposited in the herbarium of the University of Illinois.

Phlox bifida Beck var. *cedaria* (Brand) Fern. JACKSON CO.: sandstone cliff near Etherton, "Saltpeter Cave", May 12, 1955, *R. H. Mohlenbrock s. n.*

This nearly glabrous variety is rather rare throughout its entire range. Fernald (1950) lists it from "s. Ind. to Tenn. and Ark."

Myosotis sylvatica Hoffm. JACKSON CO.: campus of Southern Illinois University, Carbondale, *Biggs s. n.*

The Garden Forget-me-not was collected as an adventive in fresh dirt on the campus of Southern Illinois University.

Gerardia fasciculata Ell. JACKSON CO.: in sandy field along highway 12, two miles west of Carbondale, August 12, 1958, *R. H. Mohlenbrock 10037.*

The discovery of this Coastal Plain species in southern Illinois came as a very pleasant surprise. Numerous plants of this species occurred in a sandy field with an equally numerous amount of *Gerardia tenuifolia*. *Gerardia fasciculata* has been collected in the neighboring state of Missouri.

Solidago strigosa Small. UNION CO.: cherty slope beneath *Pinus echinata*, 3 miles northeast of Aldridge, T11S, R3W, section 10, September 22, 1958, *R. H. Mohlenbrock s. n.*

This interesting Ozark goldenrod was previously known from Missouri and Arkansas south to Georgia and Louisiana. It is distinguished by its conspicuous basal rosettes with villous-nerved leaves. Filiform stolons are produced late in the season.—DEPARTMENT OF BOTANY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE.

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ARABIS PERSTELLATA IN TENNESSEE

REED C. ROLLINS

The continued interest of Dr. E. Lucy Braun in *Arabis perstellata* during the years following her original description of it in 1940 resulted in an excellent account of the growth habit and of other significant characteristics of the species (1956). However, even with Dr. Braun's original descriptive data (1940), the supplemental information she has provided, and with the type and topotype specimens before me for study, it has been difficult to decide whether new collections of an *Arabis* from Tennessee should or should not be referred unequivocally to *A. perstellata*. The plants in question were first seen and collected in April, 1959, by Dr. R. B. Channell of Vanderbilt University, along a calcareous bluff of Stones River in Davidson County, Tennessee. Since then, Dr. Channell has made three ample collections, (one of these with Dr. Kenneth A. Wilson) with the plants in various stages of development, and he has guided me to the locality so that I could make first hand observations.

The Tennessee plants, from their morphology, belong to *Arabis perstellata* without doubt, but they differ in certain particulars from Kentucky populations which formed the basis for the original description of the species. As pointed out by Braun, *A. perstellata* is related to the species previously known as *A. dentata* (Torr.) T. & G. the name used by Hopkins in his monograph of *Arabis* in eastern North America (1937). The name *Arabis dentata*, which originated with Torrey in the genus *Sisymbrium*, is untenable in *Arabis* because it is a later homonym. Fernald (1946) renamed *A. dentata* as var. *Shortii* of *A. perstellata*, and more recently Gleason (1952) raised var. *Shortii* to specific rank, an action approved by Braun (1956) since it restored the original relationship she thought obtained with respect to the two entities involved.

In the present brief study, the first question I have sought to resolve to my own satisfaction is whether the very local *Arabis perstellata* and the widely distributed *A. Shortii* are, in fact, distinct species as maintained by Gleason and by Braun or whether a single species with several varieties, as

proposed by Fernald, best represents the facts. The evidence I have adduced coincides with that expressed by Braun (1956) and I am convinced that *A. perstellata* and *A. Shortii* should be regarded as separate species.

Up to the present, *Arabis perstellata* has been known from a relatively restricted area in northern Kentucky along the calcareous bluffs of Elkorn Creek in Franklin County. This area is approximately two hundred miles northeast of the Stones River, just east of Nashville, where Dr. Channell discovered an extensive population of *A. perstellata* that I think is somewhat different from the Kentucky population and is deserving of nomenclatural recognition.

Arabis perstellata E. L. Braun, var. *ampla* Rollins, var. nov.

Herba perennis, caulis 4-8 dm. longis, foliis radicalibus viridibus amplis 8-15 cm. longis, $n=7^1$.

Type in the Gray Herbarium collected in rich woods along calcareous bluffs of Stones River, about 1 mile northwest of junction of Couchville Pike and Fuqua Road, off Fuqua Road and about 3 miles northeast of Una, Davidson County, Tennessee, May 28, 1960, R. B. Channell 7998; isotype at Vanderbilt University. Other collections from the same general locality: April 7, 1959, R. B. Channell 7707 (GH; VDB); April 20, 1959, Kenneth A. Wilson and R. B. Channell 709 (GH; VDB); April 25, 1960, Reed C. Rollins, R. B. Channell, Otto T. Solbrig, Frank J. Hiltferty and David G. Lloyd 6012 (GH; VDB); May 20, 1960, R. B. Channell 7966 (GH; VDB).

The most striking features of var. *ampla* are the large leaves terminating the main axis and the greatly elongated fertile branches. In fact, the dimensions of leaves and branches in var. *ampla* are two to three times those of var. *perstellata*. In addition, the leaf-margins are more nearly entire being shallowly repand to dentate and uncommonly toothed in var. *ampla*, whereas they are usually dentate, toothed or lobed in var. *perstellata*, the lower cauline leaves and some of the leaves of the vegetative axis being lyrate-pinnatifid. In var. *perstellata*, the dense covering of trichomes produces a whitish to greyish-green appearance, whereas in

¹Chromosome count made by Dr. Otto T. Solbrig.

var. *ampla*, the trichomes are much less dense and the plants are green or only slightly greyish.

The growth habit of var. *ampla*, appears to be very much like that of var. *perstellata*. The main axis is terminated by a tuft of petiolate leaves and the fertile branches arise laterally below this terminal group of active leaves in the axils of leaves of the previous growing season. The leaves of the lateral fertile branches are strongly auriculate except toward the base of the branch. In both varieties, the early season leaves are more toothed or lobed than are those developed later in the season. Var. *ampla* is more lax and weak-stemmed than var. *perstellata* and the leaves seem to have a thinner texture than do those of var. *perstellata*. As to the nature and distribution of the trichomes, the varieties are similar except for the relative abundance per unit of surface area, the density being much greater in var. *perstellata*.

From all of the evidence we have at the present time, each variety of *Arabis perstellata* is very restricted in distribution. The new variety *ampla* of Tennessee represents a significant range extension for the species and it appears that the Kentucky and Tennessee populations have been separated long enough to have evolved distinctive features worth nomenclatural recognition. — GRAY HERBARIUM OF HARVARD UNIVERSITY.

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ALEXANDER WILLIAM EVANS (1868-1959)

JOHN R. REEDER AND CHARLOTTE G. REEDER

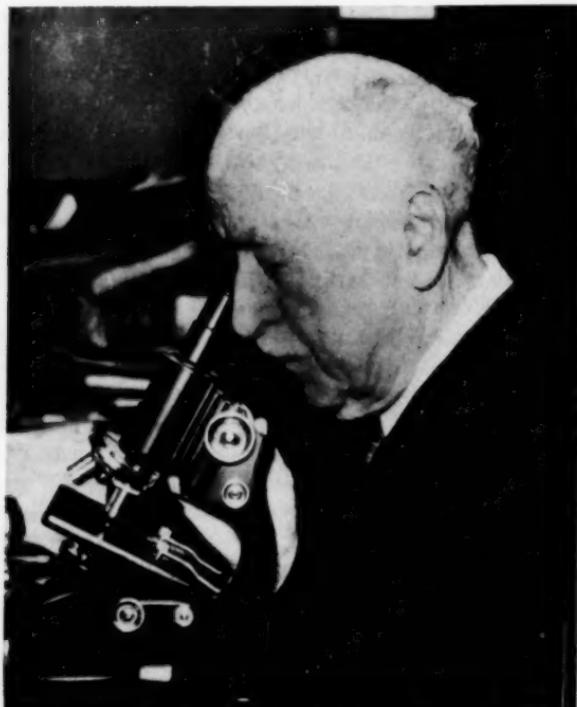
Dr. Alexander W. Evans, one of the world's leading authorities on hepaticology and lichenology, died December 6, 1959 at the age of 91. Death came as the result of pneumonia contracted as he was recovering from an operation for a broken hip suffered on October 18th. Until this accident he had been in good health and customarily spent part of each day working in his room at the Osborn Botanical Laboratory.

The son of a manufacturer and shipping line operator, Alexander William Evans, the youngest of seven children, was born in Buffalo, New York, on May 17, 1868. The Evans family was one of the oldest and most respected in Buffalo, having been engaged in the shipping business there since 1832. Here Evans spent his early boyhood, but in 1880, after his father's death, the family moved to New Haven and this was Dr. Evans' home for the remainder of his life. That Evans inherited his longevity is suggested by the fact that his mother had attained the age of 99 years at the time of her death in 1925.

Upon graduation from Hillhouse High School in New Haven, Evans enrolled in the Sheffield Scientific School of Yale University, receiving a Ph.B. degree in 1890. As an undergraduate he was a distinguished student, and the Class Book for 1890 cites him for "excellence in all studies." Apparently he had an exceptional aptitude for the sciences and languages. At one time or another he stood at the top of his class in German, mathematics, chemistry, and physics, or shared this honor with a fellow student. He was elected secretary-treasurer of his senior class. Although preparing for medical school, Evans was collecting and studying liverworts throughout his college years, and the subject of his senior essay was "Classification of the Hepaticae."

Entering the Yale Medical School in 1890, Evans received his M.D. degree two years later. In his final year there he also served as an assistant in chemistry. It seems that his heart was really in botany, however, for although making a fine record in medical school, he had published three papers on the Hepaticae by the time he had received his medical

degree. As soon as his two-year internship in the New Haven Hospital was completed, he left for Europe in order to study botany under Professor Kny at the University of Berlin. These studies were soon interrupted, for the following



ALEXANDER W. EVANS (1868-1959)

Photograph by I. M. Lamb

spring he received news of the unexpected death of his former professor, Daniel Cady Eaton, along with an invitation to return to Yale and take charge of botanical instruction. Appointed first as instructor (1895-1901), then as assistant professor (1901-1906), Dr. Evans was promoted in 1906 to Daniel Cady Eaton Professor, a position he held until his retirement in 1936. As an emeritus professor he continued his researches with as much vigor as before and these were

not interrupted until the accident which shortly preceded his death.

It is characteristic of Dr. Evans that even though he already held a doctor's degree (M.D. 1892), soon after his appointment as botanist he began preparing a treatise to present as a Ph.D. dissertation. The story is told that, as the only member of the botany department, he rejected his first thesis, and, although publishing it, admonished himself to prepare a more satisfactory one. This advice was apparently followed, for he received the Ph.D. degree in 1899. Although somewhat farcical, this story does illustrate well the high standards which Dr. Evans always set for himself with respect to his research.

Dr. Evans was an indefatigable investigator and he was the author of some 165 research papers¹ during his lifetime, many of which included beautiful illustrations from his own pen. His researches on Hepaticae, interrupted during his internship in the New Haven Hospital, were again resumed with vigor after he joined the Yale faculty. For 60 years (1896-1956) one or more research papers appeared annually except for the periods 1928-29, 1941-42, and 1946. The first of these lapses can be explained when we note that a 147 page treatise on lichens appeared in 1930, along with two shorter articles on the Hepaticae. During the second lapse it seems that Dr. Evans was working intensively to become familiar with the microchemical methods described by Asahina of Japan and to satisfy himself as to their value in lichen taxonomy. In 1943 he published two papers in which he discussed these techniques as applied to the systematics of the Cladoniae. The lapse in 1946 should need no explanation since at that time Evans was already in his 78th year of life.

For many years Dr. Evans confined his studies to the Hepaticae and by 1940 had published more than 130 papers dealing with this group. These works include the descriptions of eight new genera and some 130 new species, as well as innumerable transfers. Rather early, however, an interest in lichens was developing, and he published a short note

¹A full bibliography of Dr. Evans' writings is to be published in *The Bryologist*.

on this group in 1916. Ten years later, his first long paper on lichens appeared, and at about this time he took up the serious study of the genus *Cladonia*. From 1940 onward, his researches were confined to this genus, and in fact he was working on a manuscript the day before he broke his hip. It is remarkable that although nearly 70 when he learned of Asahina's work, Dr. Evans almost immediately began to apply these microchemical methods, and continued to use them for the remainder of his life. He was quite intrigued with the techniques, and delighted in showing anyone interested the beautiful crystals, pointing out their diagnostic value.

For a number of years after joining the Yale faculty, Dr. Evans spent part of each summer in Europe. These trips were only in part botanical. He was deeply interested in art and journeyed to observe these treasures in France, Italy, Austria, Germany, and other areas. He also visited botanical laboratories and accumulated literature he needed for his studies. A certain amount of botanical collecting was also accomplished, as there are in the Yale Herbarium specimens of Bryophytes collected by Evans in a number of European countries. In connection with these trips, he attended the second (Paris, 1900), third (Vienna, 1905), and fourth (Brussels, 1910) International Botanical Congresses. At the Vienna meeting he was appointed a member of the committee concerned with the nomenclature of Hepaticae and was reappointed at successive Congresses until the ninth (Montreal, 1959). In 1953 he was invited to accept the Honorary Presidency of the Section on Lichenology at the VIII International Botanical Congress to be held in Paris the following year. He was greatly pleased by this honor and hoped to attend the Congress, but unfortunately was unable to make the trip.

In connection with his botanical studies, Dr. Evans collected extensively in his home state of Connecticut. This was begun while he was still an undergraduate student, and in the Yale Herbarium are specimens of liverworts collected by him in 1888. He did field work in other parts of New England as well, and there are records of numerous trips which he made to the White Mountains in New Hampshire.

He also visited adjacent Canada, as well as New Jersey and New York. Additional collecting was done by him in some of the southern states, particularly the Carolinas, Alabama, and Florida. Five trips to this latter state were made especially to collect *Cladonia* and most of the counties of the state were visited. The first trip was in 1938, the others annually from 1947 to 1950. The Caribbean Islands also received his attention and two trips were made to Puerto Rico (1900, 1902) and to Jamaica (1903, 1906). Some of the other islands were visited on subsequent trips made some 20 years later. Another excursion took him to Columbia, Venezuela, and Panama.

In 1914 Evans married Phoebe Whiting, the daughter of a prominent New Haven family. Three daughters were born of this marriage. Mrs. Evans and two of the daughters survive him. Many of the trips which Dr. Evans made after 1914 were in the company of some member of his family.

The collecting activities of Dr. Evans were not confined exclusively to plant specimens; he was also an avid stamp collector. This hobby was apparently a source of great pleasure to him, and he devoted considerable time to it, particularly in his later years. At the time of his death he had amassed a substantial collection which was valued at several thousand dollars.

A gentle kindly person and rather retiring, Dr. Evans had a warm personality, a keen sense of humor, and enjoyed the respect and esteem of all who knew him. His former students remember him as an excellent teacher. To have published as extensively as he did, he was of necessity much preoccupied with research. Nevertheless, he was generous with his counsel which was freely given when requested, but it was not in his nature to intrude his views upon others unsolicited. His gift for writing concise English was well-known, and elicited comments from even the late M. L. Fernald, himself no literary pariah². For more than

²In this connection, Fernald in 1949 had inadvertently referred to "the late Alexander W. Evans". Being fast on his feet to make an unexcelled recovery, Fernald, just a few months before his own death, wrote [Rhodora 52: 49-51. 1950] a delightful little article entitled, "Long Life to Alexander W. Evans" in which he not only paid tribute to Evans but forcefully brought out the point that many botanists live to a ripe old age. Ed.

a quarter of a century (1907-1934) Evans was a member of the editorial board of the *Bulletin of the Torrey Botanical Club*, serving as its editor-in-chief from 1914-1924. He was also an associate editor of *The Bryologist* for a number of years.

That he was not a narrow specialist is shown by the fact that he was a charter member of the Connecticut Botanical Society, as well as its first president. He was also a long-time member of the Torrey Botanical Club and the New England Botanical Club. For many years a member of the Connecticut Academy of Arts and Sciences, he served as its secretary from 1897-1903. He was Vice President of the Botanical Society of America in 1911, while in 1912 he was elected to membership in the American Academy of Arts and Sciences.

Esteem for Dr. Evans and respect for his researches continued long after his official retirement. He took great pride in the fact that on the occasion of the centennial of its Sheffield Scientific School, in 1947, his alma mater, Yale University, awarded him an honorary Sc.D. degree. Another honor, which touched him as deeply came to him in his 88th year. As part of its 50th anniversary celebration, the Botanical Society of America included him as one of the 50 most outstanding living American botanists.—OSBORN BOTANICAL LABORATORY, YALE UNIVERSITY.

OBSERVATIONS ON THE EPIDERMAL STRUCTURE AND STOMATAL APPARATUS OF SOME MEMBERS OF THE ARACEAE

EDGAR E. WEBBER¹

Engler (4) determined that if the *Araceae* were to be classified as a natural group, flower structure alone was insufficient. Detailed anatomical and morphological study led him to classify the family into eight subfamilies, the *Pothoideae*, *Monsteroideae*, *Calloideae*, *Philodendroideae*, *Lasioioideae*, *Colocasioideae*, *Aroideae*, and *Pistioideae*.

An earlier taxonomic work by Engler was published by DeCandolle (3) and was basically similar to his aforementioned system, except that in his earlier study Engler had *Calla* placed with the *Pothoideae*, *Nephthytis* and *Syngonium* included in the *Lasioioideae*, and *Dieffenbachia* and *Aglaonema* were separated out into the *Aglaonemoideae*. The later study caused Engler (4) to include *Calla* in the *Calloideae*, a new subfamily; *Syngonium* was removed to the *Colocasioideae*, and *Dieffenbachia* and *Aglaonema* were placed in separate tribes in the *Philodendroideae*.

Following this more complete system, then, representatives of all but two subfamilies, the *Calloideae* and *Pistioideae*, were studied. Members of these two groups were unavailable for my work.

MATERIALS AND METHODS

Mature leaves were taken from plants grown under similar environmental conditions in a greenhouse and cut into sections approximately 4 mm. square. These were immediately fixed in formalin-propionic-acid, then embedded in paraffin, sectioned, and stained with safranin and fast green. Cross sections were made at 10 μ , and paradermal sections at 12 to 14 μ . No distinction was made in the cross sections as to whether they were parallel with or at right angles to the main axis of the leaf.

DISCUSSION AND RESULTS

A. EPIDERMIS.—Dalitzsch (2) noted that the epidermal

¹I wish to thank Dr. F. M. Hueber for making the drawings (Fig. 1-8) from my photomicrographs.

cells found in various genera of the *Araceae* were of different sizes and shapes. Also, that in *Amorphophallus bulbifer*, *Homalomena coeruleascens*, and *Alocasia cuprea* undulations of the side walls occurred, as seen in surface view. He made no distinction as to which epidermis was concerned. Of the genera sampled in this study the following situations were observed. In *Nephthytis Cravenreuthii* both epidermal layers have cells with most pronounced side wall undulations (Fig. 1). *Aglaonema costatum*, *A. pictum*, and *A. marantaefolium* show undulated walls only in upper epidermal cells. *Cryptosperma Johnstonii* shows the undulations, not as pronounced, present in both epidermal layers. The lower epidermis of *Arisarum vulgare* and the upper epidermis of both *Arum italicum* and *Arum hygrophyllosum* exhibit very weakly undulated cell walls. Watson (7) proposes an explanation of waviness of epidermal cell walls on the method of hardening of the differentiating cuticle. Working with *Hedera helix* L., he determined that most undulations appeared in leaves grown in light shade.

In cross sectional aspect the epidermal cells may be raised in their centers giving the entire cell a more or less dome shaped appearance. Such was observed in *Porphyrospatha Hoffmannii*, *Philodendron gloriosum*, *Philodendron andeanum*, and *Scindapsus pictus argyreus*. *Anthurium crystallinum* and *Spathiphyllum floribundum* are also of this nature. Dalitzsch (2) reported a button-like papilla in *Colocasia antiquorum* which may be an extreme development of the phenomenon reported here (Fig. 2). In addition the aforementioned *Porphyrospatha* has the outer walls of the lower epidermal cells rounded. Some genera show more raising of the epidermal cells than others.

The cuticle of several species exhibited various degrees of "ribbing" which may occur on either epidermis or on both. In surface view the "ribs" may be in the form of roughly parallel striations (Fig. 3), or may be arranged in a complex pattern (Fig. 4). Plants with cuticles of the former type include *Prophyrospatha Hoffmannii*, *Pothos hermaproditus*, *Pothos jambea*, *Aglaonema costatum*, *Aglaonema pictum*, *Aglaonema marantaefolium*, *Homalomena pygmaea*, and *Spathiphyllum cannaefolium*.



FIG. 1

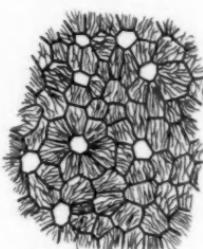
FIG. 2
(After Dalitzsch)

FIG. 3

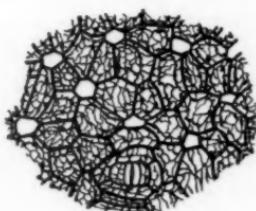


FIG. 4



FIG. 6



FIG. 5a



FIG. 5b

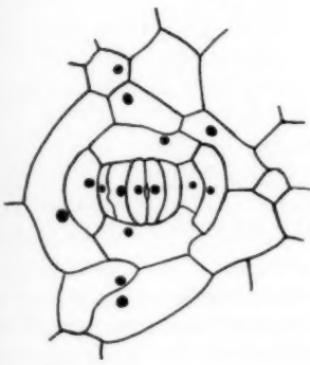


FIG. 8

FIG. 7
(Modified from Dalitzsch)

An interesting feature was noted in the epidermis of the two species of *Pothos*. In surface view the epidermal cells radiate like spokes in a wheel from a central, somewhat circular cell. Under oil it was observed that this central cell appeared to have depth due to wall thickenings which became evident upon focusing at different levels. An examination of cross sections showed these thickenings to be due to the cell walls of certain palisade cells which orient themselves beneath the epidermal cell (Fig. 5a). In *Pothos jambea* a crystal is invariably present in such an epidermal cell (Fig. 5b). With polarized light it was noted that the radiating arms of these crystals, as seen most clearly in *Pothos hermaphroditus*, assume the form of an arrowhead.

Dalitzsch (2) mentioned that in the lower epidermal cells of *Anthurium Scherzerianum* and *A. magnificum* the occurrence of calcium oxylate granules, and these he called "druzen". Of the species considered here only *Anthurium scandens* was found to contain such cells. These "druzen" can be observed macroscopically as small, dark dots in the under surface of the leaf. Microscopic sections failed to give clear and definite evidence for the presence of such cells, and accordingly free-hand sections of several leaves were made. Here it was noted quite clearly that the "druzen" was not a cell but an aggregation of cells, differing in appearance from the epidermal cells, circularly arranged about what appeared to be a central pore. The exact nature of this pore was not determined, nor did it seem in any way like a stoma. Furthermore, each cell in this ring, and the number of rings of cells varied from one to three, was completely filled with a dark brown substance. Dalitzsch (2) had also applied the term "druzen" to an extracellular substance which collected under the epidermis.

Many genera in the *Araceae* have perforations of varying sizes in their leaves. In *Monstera deliciosa*, for example, the exact cause of these holes is unknown. By examination of the leaves of *Epipremnum pinnatum* the sequence in their formation was clearly seen. First, a small, non-chlorophyllous dot appeared. This enlarged slightly, followed by the presence of a tiny hole in the center of this white dot.

Through an increase in size this hole soon appeared as the typical perforation. The latter varied in size not only from leaf to leaf but also in the same leaf.

B. STOMATA.—In cross section, the accessory cells were seen to partially surround the guard cells, and the wall of the latter which was farthest from the stomatal pore was slightly concavely bent. This was true in all plants studied. The stomata neither extended above nor below the epidermal surface. Wall thickenings of the guard cells gave the appearance of "horns" in all species. The length of these horns was not constant, but varied with the specimen from very short protuberances to rather long and reflexed ones. *Schismatoglottis* and *Arisarum* are examples of the former, while the latter was seen in *Aglaonema marantaefolium* (Fig. 6).

With respect to the type of stomatal apparatus, Dalitzsch (2) distinguished two types "from which one species or another deviates only in a small degree". In surface view one kind of apparatus is seen to consist of one pair of accessory cells at the sides of the guard cells (Fig. 7). The second general type has two pairs of accessory cells at the sides and one additional pair which limit the top and bottom of the stoma, giving the appearance of a ring of four cells about the stomate, thus showing a total of six accessory cells (Fig. 4). In *Pothos jambaea* this ring often has an additional accessory cell at the side, giving a total of seven or eight (Fig. 8). The upper epidermis of *Philodendron bipinnifolia* has two pairs of accessory cells at the sides of the guard cells, and only occasionally is there a full ring present. The upper epidermis of *Monstera deliciosa* also exhibited a diversion from the one ring type; here, the first pair of accessory cells often appeared as two individual cells occupying the space where normally one accessory cell would be. This two-celled condition may be either on one or on both sides of the guard cells. Another variation noted by Dalitzsch (2) in *Dieffenbachia Seguine* was the occurrence of a double or triple ring of accessory cells. In *Dieffenbachia Hoffmanii* great variation in the type of stomatal apparatus was manifested, and in a few cases such a double ring was seen. *Monstera deli-*

TABLE I. Plants listed according to type and distribution of stomatal apparatus¹.

I.	a) One pair of accessory cells <i>Nephthytis Cravenreuthii</i> <i>Philodendron gloriosum</i> <i>Philodendron Florida compacta</i> <i>Philodendron andeanum</i> <i>Anthurium undatum</i> <i>Anthurium sandens</i> <i>Anthurium crystallinum</i> <i>Azaphenax pictum</i>	III. b) One ring of four accessory cells <i>Monstera Friedrichsthallii</i> <i>Schiamatoglottis nova-guineensis</i>
II.	b) One ring of four accessory cells <i>Scindapsus aureus</i> <i>Philodendron lachneatum</i> <i>Spathiphyllum floribundum</i> <i>Pothos jamaica</i>	IV. a) Upper epidermis one pair of accessory cells; lower, one ring of four <i>Philodendron oxycardium</i> <i>Rhodopatha picta</i>
II.	a) One pair of accessory cells <i>Syngonium erythrophylgium</i> <i>Prophyropotha Hoffmannii</i> <i>Monstera acuminata</i> <i>Monstera sp.</i> <i>Dieffenbachia Hoffmannii</i> <i>Philodendron auriculatum</i> <i>Spathiphyllum cannaefolium</i>	b) Upper epidermis with two lateral pairs of accessory cells; lower, one ring of four <i>Philodendron bipinnatifidum</i>
III.	a) One pair of accessory cells <i>Epipremnum sp.</i> <i>Spathicearpa sagittifolia</i> <i>Arisarum vulgare</i> <i>Arum italicum</i> <i>Arum hygrophylgium</i>	c) Upper epidermis poorly preserved; lower with one ring of four <i>Seindapaus picta aryreus</i> <i>Epipremnopsis Huegeliana</i>
V.		V. a) One pair of accessory cells <i>Philodendron cordatum varigatum</i> <i>Syngonium podophyllum</i> <i>Pothos hermaphroditus</i> <i>Crypsperma Johnstonii</i> <i>Aglaonema costatum</i> <i>Homalomena pygmaea</i> <i>Epipremnum pinnatum</i> <i>Monstera deliciosa</i>
VI.		Raphidophora celatocaulis
		IV - Stoma both surfaces; apparatus different. V - Stoma both surfaces; apparatus similarly variable. VI - Stoma both surfaces; lower epidermis constant, upper variable. I - Stoma on lower epidermis only; same apparatus. II - Stoma on lower epidermis only; apparatus variable. III - Stoma both surfaces; apparatus same for a given layer or for both layers.

ciosa, in addition to the above phenomenon, often appeared to approach the double ring condition, but it was difficult to determine whether this might in part be due to flattened epidermal cells rather than distinct accessory cells. *Syngonium podophyllum* and *Pothos hermaphroditus* also appeared to approach the double ring condition.

Contrary to earlier work (2), the *Araceae* can not be separated into two groups each based on a distinct type of stomatal apparatus, for the following situations are evident: an epidermis may be entirely of one type of apparatus; an epidermis may vary in the type of apparatus; two epidermal layers may be of one type, or they both may have a similar variation in the type of apparatus; one epidermis may vary in one type while the other is constant for a different type; or, both epidermal layers may be of the same type of apparatus.

Table I summarizes the species studied as to their stomatal apparatus.

CONCLUSIONS

It is customary to consider variability to be a primitive characteristic and constancy to be advanced. The Pothoideae would then be expected to show, perhaps, the most variation in stomatal apparatus, if the latter were to be used as a taxonomic feature. Bailey and Nast (1) found that stomatal features were of value in the anatomy and taxonomy of the *Winteraceae*. Rea (6) has also shown that the number of stomates in *Campanula* increases with light and dry habitat. Florin found the stomatal apparatus to be of very great significance in the taxonomy of the Cycads and Cycadeoides.

While anatomical details of the *Araceae* have here been further expanded and elaborated, it is doubtful if any taxonomic significance can be drawn from these findings.

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STEPPE, TAIGA, AND TUNDRA.¹ — Anyone hereabouts contemplating "the magnificent Flora USSR" may have wondered: "But what if some regional botanist within its range should desire to publish a flora of his area? Would that be allowed, and would divergent views in systematic botany be permitted, let alone supported, by national science organizations in the USSR?" That the answer is "yes" is signified by the appearance and contents of this two volume Flora of Central Siberia, by M. G. Popov. In addition to this, floras of the Murmansk, Tadzhik, Caucasus, Yakut, and Northern Mongolia regions have appeared during the 1950's.

The territory covered by this flora, as defined by the author, is 2000 kilometers east to west, and 1000 kilometers north to south. Westward its limit is 92° east longitude in the Enisee area, and eastward it extends to 122° east 1., or the Olekmoi line; northward to the 60th parallel, and southward to about the 48th parallel, or the border of the Mongolian Peoples' Republic. A glance at a map of Canada will show that Alberta, Saskatchewan, and Manitoba, with southeastern British Columbia east of 120°, form a block almost exactly the same size, occupying almost the same territory latitudinally and longitudinally in the western hemisphere. In both territories the drainage is northeastern and northwestern, and within them eastern and western floristic elements of their respective continents meet.

The author, Popov, defines therein 6 principal areas: 1. The Eniseian; 2. The Saian Mountain Taigan area, mountains with a rich alpine flora, and a pine—larch taiga; 3. The Central Siberian Taigan area, mostly high plateau, with

¹The Flora of Central Siberia by Mikhail Grigorevich Popov. Vol. I, 1957. pp. 1-556. PIs. 1-65. Vol. II, 1959. pp. 557-920. PIs. 66-104. Published by the East Siberian Affiliate of the USSR Academy of Sciences, Moskow — Leningrad. Foreword by Boris K. Shishkin, editor. Price approximately \$4.00 per volume in US currency.

considerable steppe vegetation; 4. The Baikal Taigan area, the lake shore and the mountains bordering it, which have an extensive alpine tundra flora above a pine taiga; 5. The Daurian Steppe area, mostly plains, bordered northward by pine — larch taiga and southward by the Mongolian steppes; and 6. The Vitim — Patomsk Taigan area, with mountain ranges having an alpine flora above a Daurian larch taiga.

The political capital of this area is Irkutsk; and Baikal, the largest freshwater lake in Asia, and sixth largest in the world whose geological history extends back to Jurassic times, and whose hundreds of unique animal species are famous in zoology, is the center of geographical interest.

The author dedicates the flora to "the great botanist and man, Nikolai Stepanovich Turczaninov" or Turchaninov by modern transliteration, who was the leading botanist of past-century czarist Russia. The help of eleven individuals, ranging from the president of the Siberian Affiliate of the National Academy to two student assistants is acknowledged. No families or other groups were relegated to specialists; Popov is the sole author. There is a frontispiece portrait of Turczaninov, and a picture of the author at his work desk. Of the approximately 2000 numbered species in the flora, 143 are of "Turcz." authorship, while one genus and 11 species are named after him. The names Pallas, Bunge, and Willdenow appear frequently. However Linnaeus is the author of 682 of the species according to my count, and of about 300 genera in addition. *Sibiricus (a-um)* is the name of 50 taxa, while 20 species are *baicalenses*, and *daurica* or *dahurica* is the designation of 36.

Certain past-century travelers in Siberia had occasion to note in Irkutsk ("the Paris of Siberia") a spirit of political and religious independence from Moskow and Petersburg. Some such individuality is evident in the present volumes. In the introduction to what he designates "our conspectus" or "our conspectus flora" the author Popov writes: "Fundamentally only one system exists for Angiosperms, that outlined in 1818-1820 by Pyramus DeCandolle," "I categorically reject the concept of (phylogenetic) family relationships in vogue among other botanists." However, out

of respect to "the custom established for us by Russians and Germans brought up on the Engler system" he places the Monocotyledons before the Dicotyledons. "I wish in no way to convey the idea that Monocotyledons preceded the Dicotyledons in evolution; both are of simultaneous origin." he writes.

The author's stand in regard to species is conservative, with only a moderate number of varieties being recognized. With genera he is more liberal. Thus, *Ranunculus salsuginosus* is *Halerpestes salsuginosa*, and *Potentilla fruticosa* is *Dasiophora fruticosa*, for example.

Except for certain cases noted below there are no keys to higher groups, families, genera, or species. In genera of several to many species there are key characters interlined between species or groups of species, in the style of the older Grays Manuals. The bulk of the 900 plus pages is occupied therefore by brief to prolonged descriptions of families, genera, species and ranges. The details of regional distribution are numerous and satisfactorily thorough. With the paragraph on the range of an acceptable, i. e. numbered species, one will find a descriptive line and locality or two for what the author considers inconsequential, or doubtful micro-species. Thus, *Carex*, inevitably the largest genus, has 94 numbered species, with 58 additional receiving more or less honorable mention. Similarly, while an approximate 2000 is the total number of species per the author's statement and the reviewer's check as well, the total treated or touched upon in some way is 2620 according to the index count.

"When genera or species are merged, or when a taxon is raised or lowered in rank, or reduced to synonymy," that, so someone wrote me in effect, "should be done only as part and parcel of a thorough study of the group concerned, not in a local list. Reasons should be given and specimens should be cited. The mere indication that the change seems desirable to the author is not enough." This stand has been echoed by others but it has rarely been followed. In the present work it is refreshing to note that there is little if any burial in synonymy without explanation. There are even a number

of resurrections. In the genus *Carex* for example, contrary to the Flora USSR Vol. III, many sectional and subsectional names by Kükenthal, Theodor Holm, Tuckerman, Drejer, et al. are restored, replacing those used by Krechetovich. Moreover "*Carex rigida* Goodenow", and "*Carex Goodenoughii* Gay", long since banished elsewhere (cf. Fernald, Rhodora 44: 229, 300, 1942), are back in good company.

Some evidence of editorial liberality is evident in that: (1) there is no definition or discussion of the Eniseian area; (2) there are numerous remarks and comparisons with related species outside the scope of the flora; (3) the table in the introduction lists 42 as the number of genera of Cruciferae, whereas only 39 are treated in the text; (4) notwithstanding "We provide no dichotomous keys for identification but separate genera into sections groups and series", yet keys, mostly extracted from the Flora USSR, for *Alchemilla*, *Hedysarum*, *Myricaria*, *Thymus*, and *Mentha*, and Shishkin's key to the genera of Umbelliferae from the same work are included.

The author notes that in his region endemics are comparatively few. However, two monotypic genera, *Borodinia baicalensis*, a crucifer, and *Tridactylina Kirilovii*, a composite, and 17 additional species are peculiar to the basin of Baikal. In comparison to the great number of animal endemics which have been and are still being described from the waters of the lake, these, obviously are not impressive.

All the geobotanical points of interest may not come within the scope of a review. However, similarities in this flora to that of montane and alpine New England, Canada, and the Rocky Mountains are inescapable. Nearly all of its species of ferns, *Juncus*, and *Potamogeton* are in the above areas. Of the principal formation, the mighty, vast and dense Taiga, the coniferous species are Eurasian, with the exception of the panboreal *Juniperus communis*. And of no little interest is the evidence that the ericaceous species in the shade of the Taiga: *Chimaphila umbellata*, *Moneses uniflora*, *Pyrola incarnata*, *P. minor*, *P. chlorantha*, *Ramischia secunda*, *R. obtusata*, *Monotropa hypopitys*, *Ledum palustre*, *Loiseleuria procumbens*, *Phyllodoce coerulea*, *Cassiope tetra-*

gona, *C. ericoides*, *Andromeda polifolia*, *Cassandra calyculata*, *Arctostaphylos uva-ursi*, *Arctous alpina*, *Vaccinium uliginosum*, *V. myrtillus*, *V. vitis-idaea*, *Oxycoccus quadrangularis* (*O. palustris*, *O. oxyccoccus* syns.), are individually more pantaigan and panboreal than the coniferous species of the Taiga itself.

The quality of the paper, the printing, the binding, and especially the illustrations are well above that of the volumes of the Flora USSR, and compares very favorably with that of most modern floras.

The numerous instances of typification of boreal plants falling within its territory, and its abundance of distributional details should render this flora a necessity wherever plant systematics and plant geography are seriously studied. Of considerable contemporary interest should be the fact that much is being undertaken and achieved in Siberian science, as is well documented by the material pouring into the Library of Congress. — LEON KELSO, WASHINGTON, D. C.

THREE GRASSES APPARENTLY NEW TO MASSACHUSETTS.—

In *Rhodora* 35: 261,262 (1933), I reported finding a number of interesting adventive plants on the beds of Gray & Cole's Nursery in Ward Hill, Haverhill, Essex County, Massachusetts. In June 1955, I revisited the nursery and found *Poa chapmaniana* Scribn., *Holosteum umbellatum* L. and *Draba verna* L. var. *boerhaavii* Van Hall still persisting after over twenty years. While there, I collected a specimen of what appeared to be *Alopecurus geniculatus* L. but closer examination made me suspect that it might be *A. carolinianus* Walt. Since Hitchcock's Manual of the Grasses did not report the species north of New Jersey, I put the specimen aside for further study. In May 1959 while collecting *Draba verna* in a flower-bed beside a house in Old Deerfield, Franklin County, Mass., I again found the same grass. During a recent trip to Washington I showed the specimens to Dr. J. R. Swallen and he confirmed my identification of *A. carolinianus*. The New Britton and Brown Illustrated Flora lists the species as being found north to Massachusetts but Hitchcock and the 8th edition of Gray's Manual give New Jersey

as the northern limit. The species is not represented in the herbarium of the New England Botanical Club and the most northern collections in the Gray Herbarium are from the vicinity of Philadelphia.

In 1953 and 1954, I collected a number of curious adventive plants including *Scandix pecten-veneris* L., *Anagallis arvensis* L. forma *caerulea* (Schreb.) Baumb. and *Sherardia arvensis* L. growing under bird-feeders in Essex County, Massachusetts. (See Harris, S. K. Bird Feeders, a Source of Adventive Weeds. Bull. Mass. Audubon Soc. 42: 248-250 (1958)). These plants were restricted to the ground under feeders supplied with a seed mixture sold by the Massachusetts Audubon Society. Soon after the Audubon Society changed their source of supply although the mixture was kept the same and since that time no more adventives have appeared. Dr. Swallen identified two small species of *Phleum* found under feeders as *P. arenarium* L. and *P. subulatum* (Savi) Aschers. & Graebn. The former was collected on ballast in New York City by Addison Brown in 1880 and the latter on ballast in Philadelphia by Isaac C. Martindale in 1879. My collections seem to be the first for New England.

Phleum arenarium L. Massachusetts: Essex County, Boxford, S. K. Harris 8617b (14 June 1953).

Phleum subulatum (Savi) Aschers. & Graebn. Massachusetts: Essex County, Boxford, S. K. Harris 8617a (14 June 1953), 8991 (11 August 1953); Topsfield, S. K. Harris 9642 (13 July 1954).

Alopecurus carolinianus Walt. Massachusetts: Essex County, Ward Hill, Haverhill, S. K. Harris 9888 (9 June 1955); Franklin County, Deerfield, S. K. Harris 19077 (22 May 1959).

Specimens are on deposit in the herbarium of the New England Botanical Club. — STUART K. HARRIS, DEPT. OF BIOLOGY, BOSTON UNIVERSITY.

Volume 62, No. 740, including pages 205-234, was issued August 25, 1960.

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